

# 5Z Series 5.0 x 3.2 mm SMD Differential Output Crystal Oscillator

5 : 5.0×3.2×1.25 mm | SMD5032-6P

Z : Differential Output Crystal Oscillator(SPXO)

## Feature

- Output Types: LVPECL/LVDS/HCSL
- Tri-state function available
- Low Phase Jitter : 0.5pSec max.
- Pb-free/RoHS Compliant

## Applications

- Networking and communications
- Gigabit Ethernet
- Fibre Channel
- SONET/SDH



## Frequency Stability & Operating Temperature Range

| Temp. \ FT     | ±20ppm | ±25ppm | ±30ppm | ±50ppm |
|----------------|--------|--------|--------|--------|
| -20°C to +70°C | △      | ★      | ★      | ★      |
| -40°C to +85°C |        | △      | ★      | ★      |

★: Available    △: Conditional

All condition: Include 25°C tolerance, operating temperature range , input voltage change, aging, load change.

## Electrical Specifications

| Item                          | Symb.                           | Min.                                                                  | Typ. | Max.                  | Unit   | Notes                                                                                                            |
|-------------------------------|---------------------------------|-----------------------------------------------------------------------|------|-----------------------|--------|------------------------------------------------------------------------------------------------------------------|
| Frequency Range               | Freq.                           | 90.000                                                                |      | 200.000               | MHz    |                                                                                                                  |
| Standard Frequency            | Freq.                           | 100.000 , 106.250 , 125.000<br>148.500 , 150.000 , 155.520<br>156.250 |      |                       | MHz    | Contact SCTF for frequencies not listed                                                                          |
| Output                        |                                 | LVPECL                                                                |      |                       |        |                                                                                                                  |
| Operating Temperature         | T <sub>use</sub>                | -20                                                                   |      | +70                   | °C     |                                                                                                                  |
|                               |                                 | -40                                                                   |      | +85                   | °C     |                                                                                                                  |
| Storage Temperature Range     | T <sub>stg</sub>                | -55                                                                   |      | +125                  | °C     |                                                                                                                  |
| Supply Voltage                | V <sub>dd</sub>                 | 1.8 / 2.5 / 3.3                                                       |      |                       | V      | ±5% max.                                                                                                         |
| Output Load                   | L <sub>PECL</sub>               |                                                                       | 50   |                       | Ω      | V <sub>dd</sub> - 2.0 V                                                                                          |
| Current Consumption           | I <sub>cc</sub>                 |                                                                       |      | 50                    | mA     | 90MHz ≤ Freq. < 125MHz                                                                                           |
|                               |                                 |                                                                       |      | 75                    |        | 125MHz ≤ Freq. ≤ 200MHz                                                                                          |
| Duty Cycle                    | SYM                             | 45                                                                    |      | 55                    | %      |                                                                                                                  |
| Rise / Fall Time              | T <sub>R</sub> / T <sub>F</sub> |                                                                       |      | 1                     | nS     | 20% V <sub>dd</sub> to 80% Level                                                                                 |
| Start-up Time                 | T <sub>str</sub>                |                                                                       |      | 10                    | mS     | To 90% of Final Amplitude                                                                                        |
| High output voltage           | V <sub>OH</sub>                 | V <sub>dd</sub> -1.025                                                |      |                       | V      |                                                                                                                  |
| Low output voltage            | V <sub>OL</sub>                 |                                                                       |      | V <sub>dd</sub> -1.62 | V      |                                                                                                                  |
| Enable Voltage High (Logic 1) | V <sub>IH</sub>                 | 0.7V <sub>dd</sub>                                                    |      |                       | V      | Pin 1 Tri-state<br>Outputs will be enable if OE is Logic 1 or open;<br>Outputs will be disable if OE is Logic 0. |
| Enable Voltage Low (Logic 0)  | V <sub>IL</sub>                 |                                                                       |      | 0.3V <sub>dd</sub>    | V      |                                                                                                                  |
| RMS Phase Jitter              | T <sub>RPJ</sub>                |                                                                       |      | 0.5                   | pSec   | Period Jitter(12KHz-20MHz)                                                                                       |
| Phase Noise@156.25MHz         | 100 Hz                          |                                                                       | -90  |                       | dBc/Hz |                                                                                                                  |
|                               | 1 KHz                           |                                                                       | -120 |                       | dBc/Hz |                                                                                                                  |
|                               | 10 KHz                          |                                                                       | -140 |                       | dBc/Hz |                                                                                                                  |
| Aging                         | f <sub>age</sub>                |                                                                       |      | 3                     | ppm    | 1st. Year at 25°C                                                                                                |

# 5Z Series 5.0 x 3.2 mm SMD Differential Output Crystal Oscillator

5 : 5.0×3.2×1.25 mm | SMD5032-6P

Z : Differential Output Crystal Oscillator(SPXO)

| Item                          | Symb.                           | Min.                                                          | Typ. | Max.               | Unit   | Notes                                                                                                            |
|-------------------------------|---------------------------------|---------------------------------------------------------------|------|--------------------|--------|------------------------------------------------------------------------------------------------------------------|
| Frequency Range               | Freq.                           | 90.000                                                        |      | 200.000            | MHz    |                                                                                                                  |
| Standard Frequency            | Freq.                           | 100.000,106.250,125.000<br>148.500,150.000,155.520<br>156.250 |      |                    | MHz    | Contact SCTF for frequencies not listed                                                                          |
| Output                        |                                 | LVDS                                                          |      |                    |        |                                                                                                                  |
| Operating Temperature         | T <sub>use</sub>                | -20                                                           |      | +70                | °C     |                                                                                                                  |
|                               |                                 | -40                                                           |      | +85                | °C     |                                                                                                                  |
| Storage Temperature Range     | T <sub>stg</sub>                | -55                                                           |      | +125               | °C     |                                                                                                                  |
| Supply Voltage                | V <sub>dd</sub>                 | 1.8 / 2.5 / 3.3                                               |      |                    | V      | ±5% max.                                                                                                         |
| Output Load                   | L <sub>LVDS</sub>               |                                                               | 100  |                    | Ω      |                                                                                                                  |
| Current Consumption           | I <sub>cc</sub>                 |                                                               |      | 30                 | mA     | 90MHz ≤ Freq. < 125MHz                                                                                           |
|                               |                                 |                                                               |      | 40                 |        | 125MHz ≤ Freq. ≤ 200MHz                                                                                          |
| Duty Cycle                    | SYM                             | 45                                                            |      | 55                 | %      |                                                                                                                  |
| Rise / Fall Time              | T <sub>R</sub> / T <sub>F</sub> |                                                               |      | 1                  | nS     | 20% V <sub>dd</sub> to 80% Level                                                                                 |
| Start-up Time                 | T <sub>str</sub>                |                                                               |      | 10                 | mS     | To 90% of Final Amplitude                                                                                        |
| High output voltage           | V <sub>OH</sub>                 |                                                               |      | 1.6                | V      |                                                                                                                  |
| Low output voltage            | V <sub>OL</sub>                 | 0.9                                                           |      |                    | V      |                                                                                                                  |
| Enable Voltage High (Logic 1) | V <sub>IH</sub>                 | 0.7V <sub>dd</sub>                                            |      |                    | V      | Pin 1 Tri-state<br>Outputs will be enable if OE is Logic 1 or open;<br>Outputs will be disable if OE is Logic 0. |
| Enable Voltage Low (Logic 0)  | V <sub>IL</sub>                 |                                                               |      | 0.3V <sub>dd</sub> | V      |                                                                                                                  |
| RMS Phase Jitter              | T <sub>RPJ</sub>                |                                                               |      | 0.5                | pSec   | Period Jitter(12KHz-20MHz)                                                                                       |
| Phase Noise@156.25MHz         | 100 Hz                          |                                                               | -90  |                    | dBc/Hz |                                                                                                                  |
|                               | 1 KHz                           |                                                               | -120 |                    | dBc/Hz |                                                                                                                  |
|                               | 10 KHz                          |                                                               | -140 |                    | dBc/Hz |                                                                                                                  |
| Aging                         | f <sub>age</sub>                |                                                               |      | 3                  | ppm    | 1st. Year at 25°C                                                                                                |

| Item                          | Symb.                           | Min.                                                          | Typ.                                    | Max.               | Unit   | Notes                                                                                                            |
|-------------------------------|---------------------------------|---------------------------------------------------------------|-----------------------------------------|--------------------|--------|------------------------------------------------------------------------------------------------------------------|
| Frequency Range               | Freq.                           | 90.000                                                        |                                         | 200.000            | MHz    |                                                                                                                  |
| Standard Frequency            | Freq.                           | 100.000,106.250,125.000<br>148.500,150.000,155.520<br>156.250 |                                         |                    | MHz    | Contact SCTF for frequencies not listed                                                                          |
| Output                        |                                 | HCSL                                                          |                                         |                    |        |                                                                                                                  |
| Operating Temperature         | T <sub>use</sub>                | -20                                                           |                                         | +70                | °C     |                                                                                                                  |
|                               |                                 | -40                                                           |                                         | +85                | °C     |                                                                                                                  |
| Storage Temperature Range     | T <sub>stg</sub>                | -55                                                           |                                         | +125               | °C     |                                                                                                                  |
| Supply Voltage                | V <sub>dd</sub>                 | 1.8 / 2.5 / 3.3                                               |                                         |                    | V      | ±5% max.                                                                                                         |
| Output Load                   | L <sub>HCSL</sub>               |                                                               | R <sub>s</sub> =33 , R <sub>L</sub> =50 |                    | Ω      |                                                                                                                  |
| Current Consumption           | I <sub>cc</sub>                 |                                                               |                                         | 35                 | mA     | 90MHz ≤ Freq. < 125MHz                                                                                           |
|                               |                                 |                                                               |                                         | 40                 |        | 125MHz ≤ Freq. ≤ 200MHz                                                                                          |
| Duty Cycle                    |                                 | 45                                                            |                                         | 55                 | %      |                                                                                                                  |
| Rise / Fall Time              | T <sub>R</sub> / T <sub>F</sub> |                                                               |                                         | 1                  | nS     | 20% V <sub>dd</sub> to 80% Level                                                                                 |
| Start-up Time                 | T <sub>str</sub>                |                                                               |                                         | 10                 | mS     | To 90% of Final Amplitude                                                                                        |
| High output voltage           | V <sub>OH</sub>                 | 0.66                                                          |                                         |                    | V      |                                                                                                                  |
| Low output voltage            | V <sub>OL</sub>                 |                                                               |                                         | 0.15               | V      |                                                                                                                  |
| Enable Voltage High (Logic 1) | V <sub>IH</sub>                 | 0.7V <sub>dd</sub>                                            |                                         |                    | V      | Pin 1 Tri-state<br>Outputs will be enable if OE is Logic 1 or open;<br>Outputs will be disable if OE is Logic 0. |
| Enable Voltage Low (Logic 0)  | V <sub>IL</sub>                 |                                                               |                                         | 0.3V <sub>dd</sub> | V      |                                                                                                                  |
| RMS Phase Jitter              | T <sub>RPJ</sub>                |                                                               |                                         | 0.5                | pSec   | Period Jitter(12KHz-20MHz)                                                                                       |
| Phase Noise@156.25MHz         | 100 Hz                          |                                                               | -90                                     |                    | dBc/Hz |                                                                                                                  |
|                               | 1 KHz                           |                                                               | -120                                    |                    | dBc/Hz |                                                                                                                  |
|                               | 10 KHz                          |                                                               | -140                                    |                    | dBc/Hz |                                                                                                                  |
| Aging                         | f <sub>age</sub>                |                                                               |                                         | 3                  | ppm    | 1st. Year at 25°C                                                                                                |

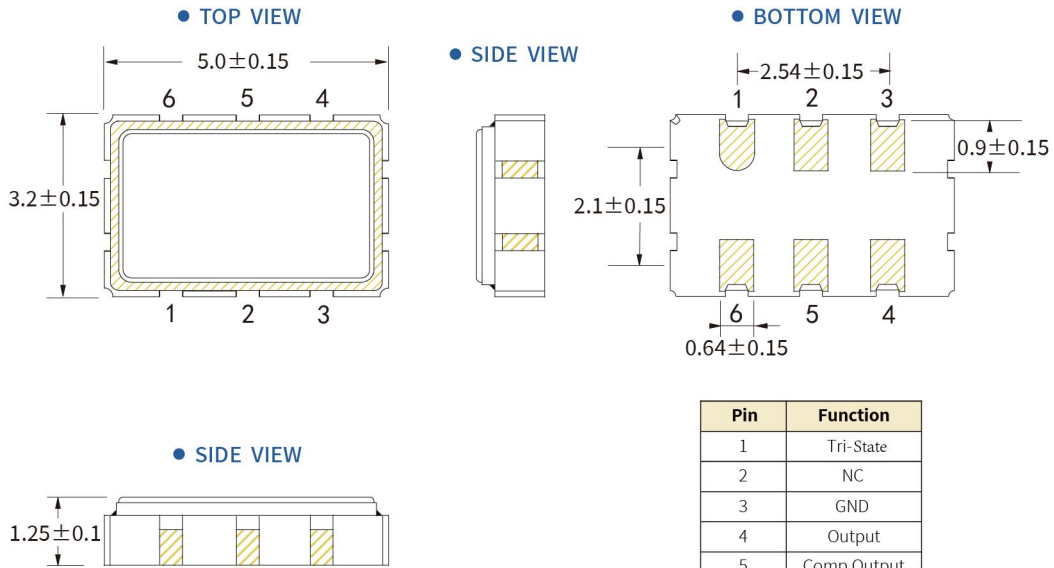
更新日期：2025年6月20日

## 5Z Series 5.0 x 3.2 mm SMD Differential Output Crystal Oscillator

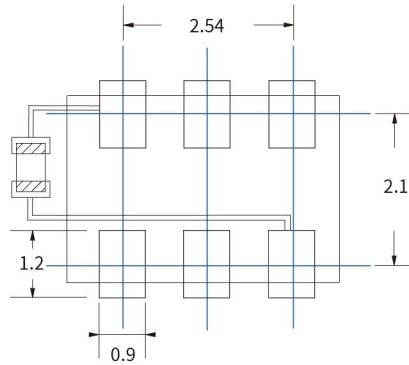
5 : 5.0×3.2×1.25 mm | SMD5032-6P

### Z : Differential Output Crystal Oscillator(SPXO)

## Dimensions (UNIT:mm)



**Solder pad layout** (UNIT:mm)



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1 $\mu$ F as close to the part as possible between Vdd and GND pads.

### Options and Part Identification : Example SX5DF100.000B20F30DNN

| Company      | Ceramic Package      | Frequency Code [MHZ] | Supply Voltage | Frequency Tolerance      | Operating Temperature      | Frequency Drift                     | Output      | Current Consumption | Phase Noise      |
|--------------|----------------------|----------------------|----------------|--------------------------|----------------------------|-------------------------------------|-------------|---------------------|------------------|
| SX           | 5DF                  | X.XXX                | B              | 20                       | F                          | 30                                  | D           | N                   | N                |
| ↓            | ↓                    | ↓                    | ↓              | ↓                        | ↓                          | ↓                                   | ↓           | ↓                   | ↓                |
| Code Company |                      | Frequency            |                | Code Frequency Tolerance |                            | Code Frequency Drift                |             | Code Current        |                  |
| SX SCTF      |                      | 100.000              |                | 10 ±10ppm<br>20 ±20ppm   |                            | 15 ±15ppm<br>20 ±20ppm<br>30 ±30ppm |             | N Standard          |                  |
|              | ↓                    |                      | ↓              |                          | ↓                          |                                     | ↓           |                     | ↓                |
|              | Code Ceramic Package |                      | Code Voltage   |                          | Code Operating Temperature |                                     | Code Output |                     | Code Phase Noise |
|              | 7DF 7.0×5.0×1.6mm    |                      | D 1.8V         |                          | E -20°C ~ +70°C            |                                     | P LVPECL    |                     | N Standard       |
|              | 5DF 5.0×3.2×1.25mm   |                      | H 2.5V         |                          | F -40°C ~ +85°C            |                                     | D LVDS      |                     |                  |
|              | 3DF 3.2×2.5×0.9mm    |                      | B 3.3V         |                          |                            |                                     | H HCSL      |                     |                  |

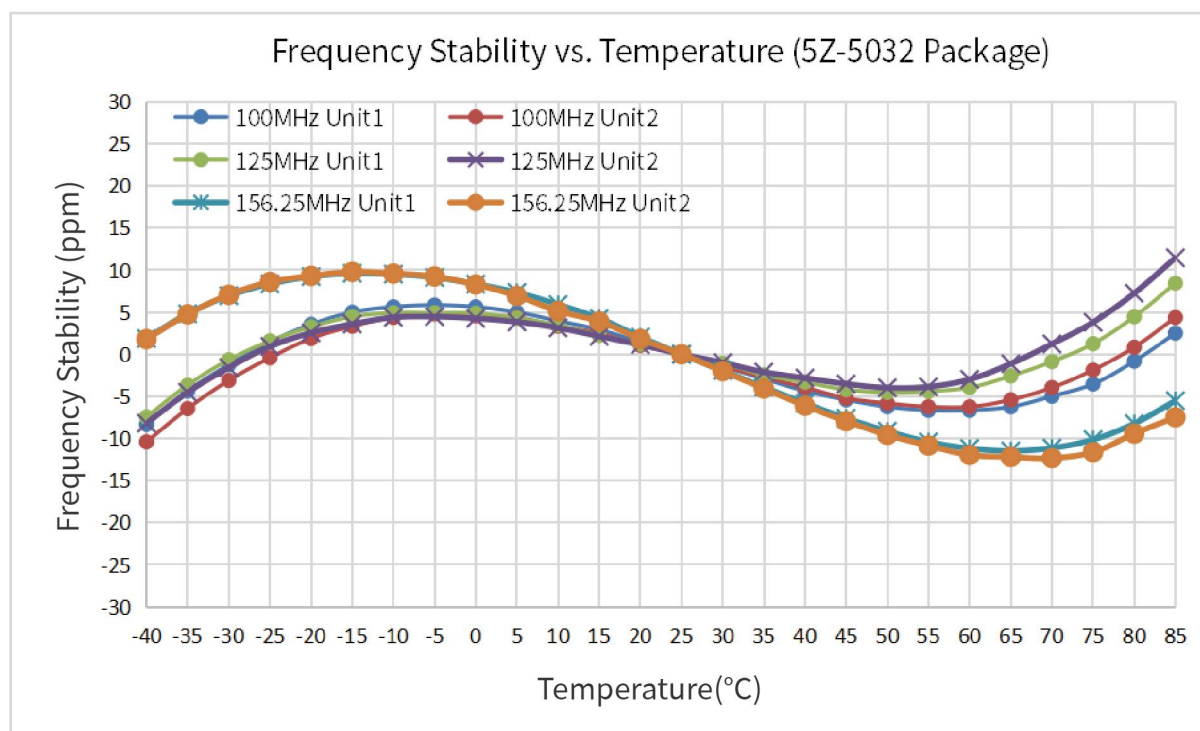
If you have other parameter requirements, you can contact **SCTF** at any time.

# 5Z Series 5.0 x 3.2 mm SMD Differential Output Crystal Oscillator

5 : 5.0×3.2×1.25 mm | SMD5032-6P

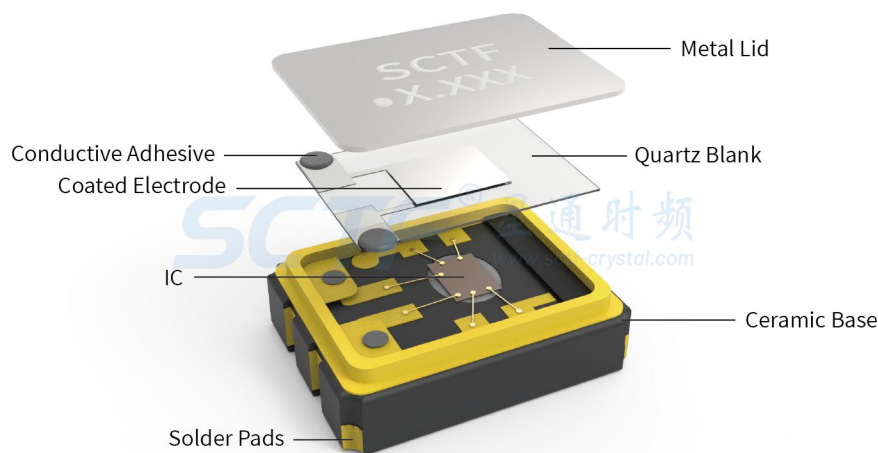
Z : Differential Output Crystal Oscillator(SPXO)

## Frequency Temperature Characteristics



## Product Structure&Marking Information

### • Product Structure



### • Marking Information

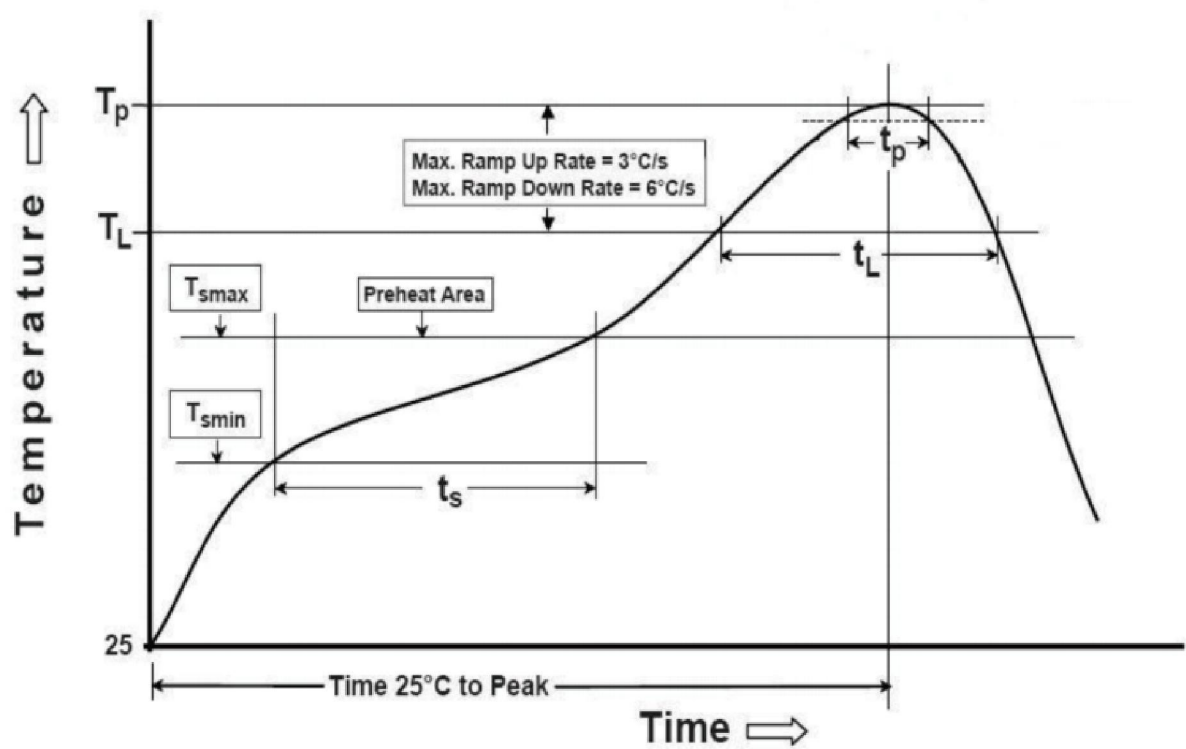


# 5Z Series 5.0 x 3.2 mm SMD Differential Output Crystal Oscillator

5 : 5.0×3.2×1.25 mm | SMD5032-6P

Z : Differential Output Crystal Oscillator(SPXO)

## Suggested Reflow Profile



| Profile Feature                                                                                                                                                      | Sn - Pb Eutectic Assembly        | Preheat / Soak                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------|
| Preheat / Soak <ul style="list-style-type: none"><li>● Temperature Min ( Ts min )</li><li>● Temperature Max ( Ts max )</li><li>● Time ( Ts min to Ts max )</li></ul> | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-120 seconds |
| Ramp - up rate ( TL to Tp )                                                                                                                                          | 3°C/ second max.                 | 3°C/ second max.                 |
| Time maintained above <ul style="list-style-type: none"><li>● Liquidous temperature ( TL )</li><li>● Time ( tL ) maintained above TL</li></ul>                       | 183°C<br>60-150 seconds          | 217°C<br>60-150 seconds          |
| Peak package body temperature ( Tp )                                                                                                                                 | 235°C                            | 260°C                            |
| Time within 5° C of the specified classification temperature ( Tp )                                                                                                  | 20 seconds                       | 30 seconds                       |
| Ramp - down rate ( Tp to TL )                                                                                                                                        | 6°C/ second max.                 | 6°C/ second max.                 |
| Time 25° C to peak temperature                                                                                                                                       | 6 minutes max.                   | 8 minutes max.                   |
| Suggest reflow times                                                                                                                                                 | 2 Times max.                     |                                  |

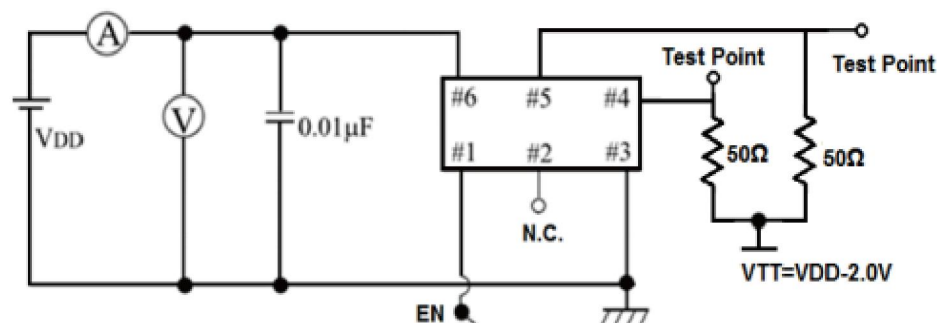
# 5Z Series 5.0 x 3.2 mm SMD Differential Output Crystal Oscillator

5 : 5.0×3.2×1.25 mm | SMD5032-6P

Z : Differential Output Crystal Oscillator(SP XO)

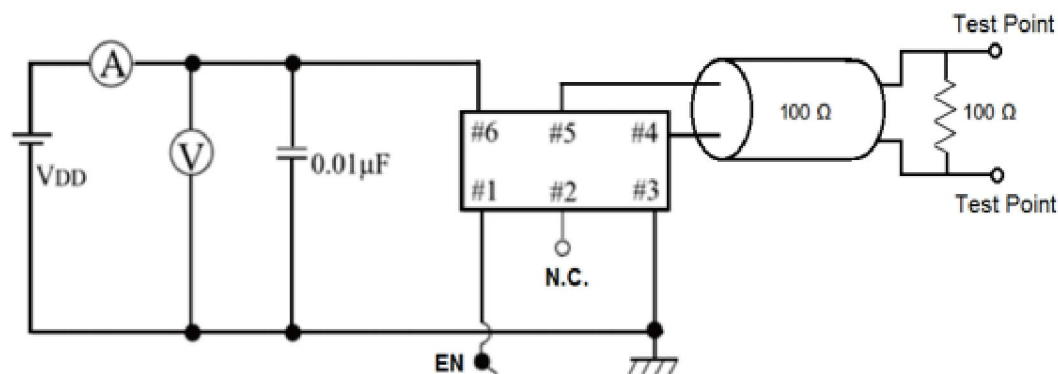
## Testing Circuit

### • LVPECL



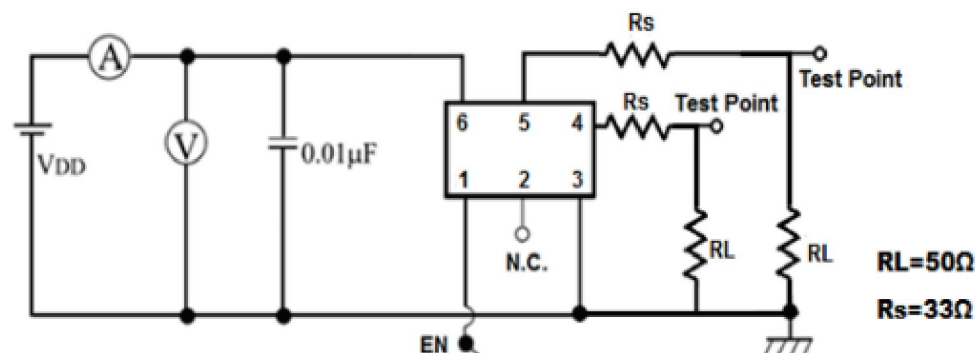
※ Notes: PIN 1 connected to Vdd or floating, the product is working properly; connected to GND, stops working.

### • LVDS



※ Notes: PIN 1 connected to Vdd or floating, the product is working properly; connected to GND, stops working.

### • HCSSL



※ Notes: PIN 1 connected to Vdd or floating, the product is working properly; connected to GND, stops working.

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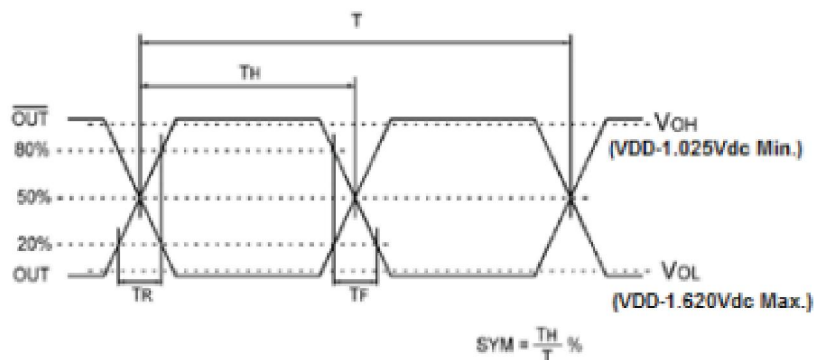
# 5Z Series 5.0 x 3.2 mm SMD Differential Output Crystal Oscillator

5 : 5.0×3.2×1.25 mm | SMD5032-6P

Z : Differential Output Crystal Oscillator(SP XO)

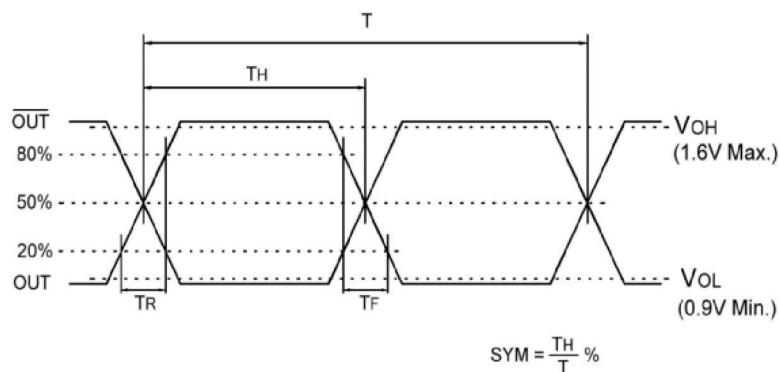
## Waveform Conditions

- LVPECL



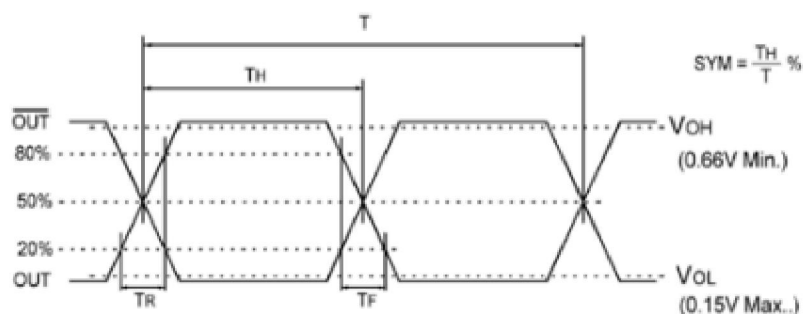
Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

- LVDS



Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

- HCSL



Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

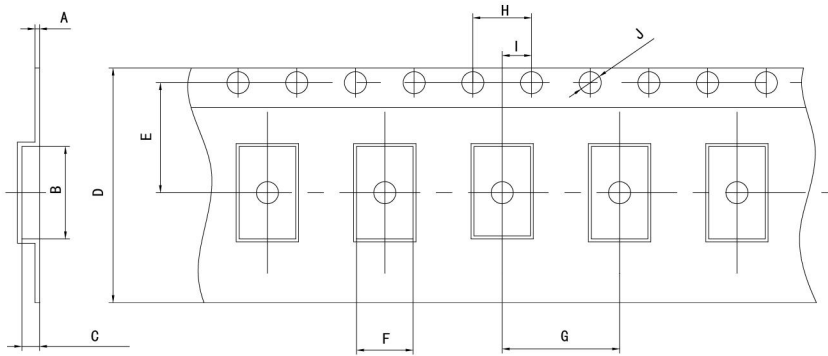
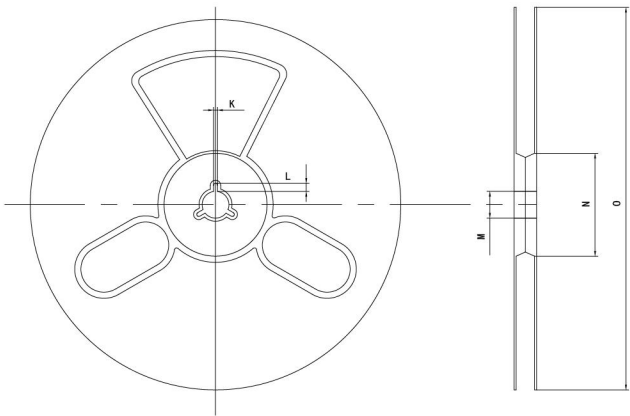
# 5Z Series 5.0 x 3.2 mm SMD Differential Output Crystal Oscillator

5 : 5.0×3.2×1.25 mm | SMD5032-6P

Z : Differential Output Crystal Oscillator(SPXO)

## Packaging Information

T=Tape and reel (1,000pcs/reel)



Pocket Tape Dimensions(mm)

| Series | A        | B       | C        | D      | E       | F       | G       | H       | I       | J        | K       | L       | M       | N     | O      |
|--------|----------|---------|----------|--------|---------|---------|---------|---------|---------|----------|---------|---------|---------|-------|--------|
| 5Z     | 0.3±0.05 | 5.5±0.1 | 1.25±0.1 | 12±0.1 | 5.5±0.1 | 3.6±0.1 | 8.0±0.1 | 4.0±0.1 | 2.0±0.1 | φ1.5±0.1 | 2.0±0.2 | 4.0±1.0 | φ13±0.5 | φ60±1 | φ180±1 |

## Common Frequencies – MHz

| 5Z Series |         |         |         |         |
|-----------|---------|---------|---------|---------|
| 100.000   | 106.250 | 125.000 | 148.500 | 150.000 |
| 155.520   | 156.250 |         |         |         |

单击下面可查看定价，库存，交付和生命周期等信息

[>>SCTF\(星通时频\)](#)